DATA COLLECTION METHOD AND NETWORK

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a data collection method and a data collection network associated therewith. More specifically, my invention is primarily relates to a data collection method that is capable of collecting data through a smart probe submerged in a medium within a closed container for impacts on the outside surface of the closed container. Such group of smart probes can be wirelessly connected together through a wireless data collection network. The data collected by such data collection network can be monitored and analyzed by a central server. Such data collection method is capable of monitoring the impacts on the outside surface of a group of closed containers by the smart probe submerged in the medium each of such closed containers contains. The current invention provides a data collection method and associated network capable of collecting data from a group of users. The current invention enables the development of a central database that includes information collected from a group of users. The current invention further enables the development of algorithm for the monitoring and analysis of data collected. The current invention still further provides a method to improve the accuracy, effectiveness and efficiency of said algorithm.

Description of the Prior Art

[0002] Data collection methods and networks have been widely adopted to collect and monitor data. Submerged smart probes are usually used to monitor and measure the content or status of the medium in a container.

[0003] U.S. Pat. No. 7,470,060 issued to Hoben et al. in December 2008 discloses a detection apparatus for measuring fluid in a vessel. Such vessel comprises at least one processor for receiving, processing and storing data from sensors in the vessel, at least one vertical support disposed within the vessel and at least one pair of sensors connected to the at least one vertical support. The sensors continuously provide measurement data to the processor, wherein the processor synchronously polls measurement data from the sensors, continuously calculates values, and compares the calculated values to at least one predetermined range of values for the fluid in the vessel to identify whether the calculated values are within the predetermined values. The processor communicates the compared value to a data collector.

[0004] U.S. Pat. No. 9,217,686 issued to Li et al. in December 2015 provides a method, apparatus, and system for monitoring the state of a fluid transport pipe. In one embodiment, there is provided a method of monitoring the state of a fluid transport pipe, the method including: causing a monitor to move along with a fluid inside the fluid transport pipe, the monitor including an elastic gas container and being configured to adjust the volume of the elastic gas container based on ambient pressure of the elastic gas container; and measuring and recording, by the monitor, one or more types of environmental data inside the fluid transport pipe for determining the state of the fluid transport pipe. In other embodiments, there are further provided an apparatus and system for monitoring a state of fluid transport pipe.

[0005] U.S. Pat. No. 9,347,848 issued to Westmoreland et al. in May 2016 discloses a marine probe with no moving parts for use in one or more tanks on a floating vessel. The marine probe has pressure transducers, temperature sensors, an inclinometer, and a probe processor electrically connected to the pressure transducers, temperature sensors, inclinometer and a probe data storage. The marine probe controls the temperature sensors and pressure transducers to produce bidirectional signals and calculate at least one physical property, performs adaptive measurement for dynamic and static synchronized and non-synchronized measurement, identifies temperature sensors and pressure transducers not covered by the fluid, measures multiple parameters of the fluid in the tank, calibrates pressure transducers in a vapor space of the tank when the pressure transducers are no longer in the fluid, and creates bidirectional signals using values from the inclinometer transferring the bidirectional signals to a client device via a network.

[0006] U.S. Pat. No. 9,535,021 issued to Kamen et al. in January 2017 discloses a sensor apparatus and sensor apparatus system for use in conjunction with a cassette, including a disposable or replaceable cassette. In some embodiments, the cassette includes a thermal well for permitting the sensing of various properties of a subject media. The thermal well includes a hollow housing of a thermally conductive material. In other embodiments, the cassette includes sensor leads for sensing of various properties of a subject media. The thermal well has an inner surface shaped so as to form a mating relationship with a sensing probe. The mating thermally couples the inner surface with a sensing probe. In some embodiments, the thermal well is located on a disposable portion and the sensing probe on a reusable portion.

[0007] The prior arts do not disclose any invention related to a data collection method and network that is capable of collecting data from and monitoring data of a group of users altogether. The prior arts do not disclose any invention related to a data collection method and network that is capable of collecting impact data on the outside surface of a closed container. The prior arts do not disclose any invention related to a data collection method and network that is capable of collecting impact data of outside surface of a group of closed containers. The prior arts do not disclose any invention related to a data collection method and network that is capable of developing an individual database for each said individual user from said data, and a central database based on all or some of these individual database associated with said group of users. The prior arts do not disclose any invention related to a data collection method and network that is capable of improving its accuracy, effectiveness and efficiency over the time.

[0008] What is needed then is to a data collection method and network that is capable of collecting data from and monitoring data of a group of users altogether; a data collection method and network that is capable of collecting impact data on outside surface of a closed container; a data collection network that is capable of collecting impact data of outside surface of a group of closed containers; a data collection method and network that is capable of developing an individual database for each said individual user from said data, and a central database based on all or some of these individual database associated with said group of